



U.S. NUCLEAR REGULATORY COMMISSION

# STANDARD REVIEW PLAN

OFFICE OF NUCLEAR REACTOR REGULATION

## PREFACE TO SECTION 5.4 COMPONENTS AND SUBSYSTEM DESIGN

The Standard Format and Contents of Safety Analysis Reports for Nuclear Power Plants under Section 5.4, "Component and Subsystem Design," contains several paragraphs that provide examples of principal components and subsystems within or allied with the reactor coolant system. The technical review of many of these principal items is conducted under the cognizance of Standard Review Plan (SRP) sections which have been prepared for other sections of the Standard Format.

An outline of the material to be reviewed and the SRP section under which it is covered is presented below for those items reviewed in other sections.

### 5.4.1 Reactor Coolant Pumps

The ~~RSB~~Reactor Systems Branch (SRXB)<sup>1</sup> reviews the process design parameters and flow coastdown and startup characteristics under various SRP Sections of Chapter 15.

The ~~ASB~~Plant Systems Branch (SPLB)<sup>2</sup> reviews the ~~Ancillary~~Auxiliary Cooling Water Systems<sup>3</sup> and the potential for pump and motor missiles under SRP Sections 9.2.2 and 3.5.1.2.

The ~~MEB~~Mechanical Engineering Branch (EMEB)<sup>4</sup> reviews the structural integrity and the method of analysis, and the inservice testing of pumps under SRP Sections 3.9.1 through 3.9.3 and 3.9.6. The ~~EQB~~EMEB also<sup>5</sup> reviews the operability of pumps under SRP Section 3.10.

The ~~MTB~~Materials and Chemical Engineering Branch (EMCB)<sup>6</sup> reviews the inservice inspection under SRP Section 5.2.4 and<sup>7</sup> the materials of fabrication under SRP Section 5.2.3, and the pump flywheel integrity under SRP Section 5.4.1.1.<sup>8</sup>

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### USNRC STANDARD REVIEW PLAN

Standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for the review of applications to construct and operate nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The standard review plan sections are keyed to the Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants. Not all sections of the Standard Format have a corresponding review plan.

Published standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555.

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The Civil Engineering and Geosciences Branch (ECGB) reviews the inservice inspection program under SRP Section 5.2.4.<sup>9</sup>

#### 5.4.2 Steam Generators (PWR)

The ~~RSBSRXB~~<sup>10</sup> reviews the configuration and process design parameters and the response to various anticipated operational occurrences and postulated accidents under various SRP Sections of Chapter 15.

The ~~MEBEMEB~~<sup>11</sup> reviews the structural adequacy and the methods of analysis of the steam generator under SRP Sections 3.9.1 through 3.9.3.

The ~~MTEBEMCB~~<sup>12</sup> reviews the materials and the inservice inspection program under SRP Sections 5.4.2.1 and 5.4.2.2.

#### 5.4.3 Reactor Coolant Piping

The ~~RSBSRXB~~<sup>13</sup> reviews the piping and instrumentation diagrams, process flow features, and equipment arrangements.

The ~~MEBEMEB~~<sup>14</sup> reviews the structural integrity, the methods of analysis, and the preoperational testing of the reactor coolant piping under SRP Sections 3.9.1 through 3.9.3.

The ~~MTEBEMCB~~<sup>15</sup> reviews the materials and inservice inspection program under SRP Sections 5.2.3 and 5.2.4.<sup>16</sup>

The ECGB reviews the inservice inspection program under SRP Section 5.2.4.<sup>17</sup>

#### 5.4.4 Main Steam Line Flow Restrictions

The ~~RSBSRXB~~<sup>18</sup> reviews the functional requirements under various SRP Sections of Chapter 15.

The ~~MEBEMEB~~<sup>19</sup> reviews the mechanical design bases and methods of analysis under SRP Sections 3.9.1 through 3.9.3.

#### 5.4.5 Main Steam Isolation Valve Leakage Control (MSIVLC) System (BWR)

The ~~ASBSPLB~~<sup>20</sup> reviews the MSIVLC system under SRP Section 6.7.

#### 5.4.6 Reactor Core Isolation Cooling (RCIC) System (BWR)

The ~~RSBSRXB~~<sup>21</sup> reviews the RCIC system under SRP Section 5.4.6.

#### 5.4.7 Residual Heat Removal (RHR) System

The ~~RSBSRXB~~<sup>22</sup> reviews the RHR system under SRP Section 5.4.7.

#### 5.4.8 Reactor Water Cleanup (RCWRWCS<sup>23</sup>) System (BWR)

The ~~CEBEMCB~~<sup>24</sup> reviews the RCWRWCS<sup>25</sup> system under SRP Section 5.4.8.

#### 5.4.9 Main Steam Line and Feedwater Piping

The ASBSPLB<sup>26</sup> reviews the functional and related requirements for feedwater and auxiliary feedwater under SRP Sections 10.4.7 and 10.4.9. The ~~ASB and PSBSPLB~~ also reviews<sup>27</sup> the functional and related requirements for the MSL piping under SRP Section 10.3.

The ~~MEBEMEB~~<sup>28</sup> reviews the structural integrity, methods of analysis, and preoperational testing under SRP Sections 3.9.1 through 3.9.3.

The ~~MTEBEMCB~~<sup>29</sup> reviews the materials of fabrication under SRP Section 10.3.6.

#### 5.4.10 Pressurizer

The RSBSRXB<sup>30</sup> reviews the configuration and process design parameters. Related safety and relief valve capacities are reviewed by RSBSRXB<sup>31</sup> under SRP Section 5.2.2, and pressure system performance during anticipated operational occurrences and postulated accidents is reviewed under various SRP Sections of Chapter 15.

The ~~MEBEMEB~~<sup>32</sup> reviews the structural integrity and methods of analysis under SRP Sections 3.9.1 through 3.9.3.

The ~~MTEBEMCB~~<sup>33</sup> reviews ~~the inservice inspection under SRP Section 5.2.4, and~~<sup>34</sup> the materials under SRP Section 5.2.3.

The ECGB reviews the inservice inspection program under SRP Section 5.2.4.<sup>35</sup>

#### 5.4.11 Pressurizer Relief Tank (PWR)

The ASBSPLB<sup>36</sup> reviews the pressurizer relief tank under SRP Section 5.4.11.

#### 5.4.12 Valves

The RSBSRXB<sup>37</sup> reviews the functional aspects of valves within and connected to the reactor coolant pressure boundary under SRP Sections 5.4.6, 5.4.7, and 6.3.

The ~~MEBEMEB~~<sup>38</sup> reviews the structural integrity and the methods of analysis of valves under SRP Sections 3.9.1 through 3.9.3 and 3.9.6. The ~~EQBEMEB~~ also<sup>39</sup> reviews the operability of valves under SRP Section 3.10.

The ~~MTEBEMCB~~<sup>40</sup> reviews valve materials under SRP Sections 5.2.3 and 10.3.6, ~~and inservice inspection under SRP Sections 5.2.5 and 6.6.~~<sup>41</sup> The ~~CEBEMCB~~ also<sup>42</sup> reviews the compatibility of fluids with valve materials under SRP Section 6.1.1.

The ECGB reviews inservice inspection under SRP Sections 5.2.4<sup>43</sup> and 6.6.<sup>44</sup>

#### 5.54.13<sup>45</sup> Safety and Relief Valves

The ~~RSB~~SRXB<sup>46</sup> reviews setpoints and capacities of reactor coolant system safety and relief valves under SRP Section 5.2.2. The SRXB also reviews the reactor coolant depressurization system for PWRs under SRP Section 6.8 (proposed).<sup>47</sup>

The ~~MEB~~EMEB<sup>48</sup> reviews the structural integrity and methods of analysis under SRP Sections 3.9.1 through 3.9.3 and 3.9.6. The ~~EQB~~EMEB also<sup>49</sup> reviews the operability of safety and relief valves under SRP Section 3.10.

The ~~MTEB~~EMCB<sup>50</sup> reviews the inservice inspection program under SRP Sections 5.2.4 and 6.6, and<sup>51</sup> materials under SRP Sections 5.2.3 and 10.3.6. The ~~CEB~~EMCB also<sup>52</sup> reviews the compatibility of fluids with valve materials under SRP Section 6.1.1.

The ECGB reviews the inservice inspection program under SRP Sections 5.2.4 and 6.6.<sup>53</sup>

#### 5.4.14 Component Supports

The ~~MEB~~EMEB<sup>54</sup> reviews the structural integrity and methods of analysis under SRP Sections 3.9.1 through 3.9.3 and 3.9.6.

**SRP Draft Section PREFACE**  
Attachment A - Proposed Changes in Order of Occurrence

Item numbers in the following table correspond to superscript numbers in the redline/strikeout copy of the draft SRP section.

Item	Source	Description
1.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for the applicable Sections of Chapter 15.
2.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 3.5.1.2 and 9.2.2.
3.	Editorial	Revised for consistency with the title of SRP Section 9.2.2.
4.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 3.9.1, 3.9.2, 3.9.3, and 3.9.6.
5.	Current PRB names and abbreviations, Editorial.	Editorial change made to reflect current PRB name and responsibility for SRP Section 3.10. Combined with previous paragraph and added "also" to reflect that PRB for 3.10 and 3.9.1, etc. is now the same.
6.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 5.2.3 and 5.4.1.1.
7.	PRB designations and abbreviations	Relocated the discussion of SRP 5.2.4 due to reassignment of the primary review responsibilities.
8.	Editorial	Added a review interface description for relevant reviews performed under SRP Section 5.4.1.1 and rearranged to provide proper punctuation, conjunctions, etc.
9.	PRB designations and abbreviations	Relocated the discussion of SRP 5.2.4 due to reassignment of the primary review responsibilities.
10.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for the applicable Sections of Chapter 15.
11.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 3.9.1, 3.9.2, 3.9.3.
12.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 5.4.2.1 and 5.4.2.2 .
13.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for the reactor coolant piping.
14.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 3.9.1, 3.9.2, and 3.9.3.
15.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 5.2.3.

**SRP Draft Section PREFACE**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
16.	PRB designations and abbreviations	Relocated the discussion of SRP 5.2.4 due to reassignment of the primary review responsibilities.
17.	PRB designations and abbreviations	Relocated the discussion of SRP 5.2.4 due to reassignment of the primary review responsibilities.
18.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for the applicable Sections of Chapter 15.
19.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 3.9.1, 3.9.2, and 3.9.3.
20.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 6.7.
21.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 5.4.6.
22.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 5.4.7.
23.	Editorial.	Changed abbreviation for Reactor Water Cleanup System to be consistent with that used in SRP 5.4.8.
24.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 5.4.8.
25.	Editorial.	Changed abbreviation for Reactor Water Cleanup System to be consistent with that used in SRP 5.4.8.
26.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 10.4.7 and 10.4.9.
27.	Current PRB Assignments, Editorial.	Editorial change to reflect current responsibility for SRP Section 10.3. Combined with previous paragraph and added "also" to reflect that PRB for 10.3 and 10.4.7 and 10.4.9 is now the same. Changed verb to agree with singular subject.
28.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 3.9.1, 3.9.2, and 3.9.3.
29.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 10.3.6 .
30.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name.
31.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 5.2.2 and applicable Sections of Chapter 15.

**SRP Draft Section PREFACE**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
32.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 3.9.1, 3.9.2, and 3.9.3.
33.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 5.2.3.
34.	PRB designations and abbreviations	Relocated the discussion of SRP 5.2.4 due to reassignment of the primary review responsibilities.
35.	PRB designations and abbreviations	Relocated the discussion of SRP 5.2.4 due to reassignment of the primary review responsibilities.
36.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 5.4.11.
37.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 5.4.6, 5.4.7, and 6.3.
38.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 3.9.1, 3.9.2, 3.9.3, and 3.9.6.
39.	Current PRB names and abbreviations, Editorial.	Editorial change made to reflect current PRB name and responsibility for SRP Section 3.10. Combined with previous paragraph and added "also" to reflect that PRB for 3.10 and 3.9.1, etc. is now the same.
40.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 5.2.3 and 10.3.6 .
41.	PRB designations and abbreviations	Relocated the discussion of SRP Sections 5.2.4 and 6.6 due to reassignment of the primary review responsibilities.
42.	Current PRB names and abbreviations, Editorial.	Editorial change made to reflect current PRB name and responsibility for SRP Section 6.1.1. Combined with previous paragraph and added "also" to reflect that PRB for 6.1.1 and 5.2.3, 5.2.4, 6.6 and 10.3.6 is now the same.
43.	Editorial.	Changed SRP Section 5.2.5 to 5.2.4. SRP 5.2.5 deals with the leak detection system, not ISI. SRP Section 5.2.4 covers reactor coolant pressure boundary inservice inspection and testing.
44.	PRB designations and abbreviations	Relocated the discussion of SRP Sections 5.2.4 and 6.6 due to reassignment of the primary review responsibilities.
45.	Editorial	Corrected subsection number.
46.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for the applicable Section 5.2.2.

**SRP Draft Section PREFACE**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
47.	Editorial, PI #25790	Added a Review Interface with SRP Section 6.8 (proposed) regarding the review of reactor coolant depressurization systems.
48.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 3.9.1, 3.9.2, 3.9.3, and 3.9.6.
49.	Current PRB names and abbreviations, Editorial.	Editorial change made to reflect current PRB name and responsibility for SRP Section 3.10. Combined with previous paragraph and added "also" to reflect that PRB for 3.10 and 3.9.1, etc. is now the same.
50.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 5.2.3 and 10.3.6.
51.	PRB designations and abbreviations	Relocated the discussion of SRP Sections 5.2.4 and 6.6 due to reassignment of the primary review responsibilities.
52.	Current PRB names and abbreviations, Editorial.	Editorial change made to reflect current PRB name and responsibility for SRP Section 6.1.1. Combined with previous paragraph and added "also" to reflect that PRB for 6.1.1 and 5.2.3, 5.2.4, 6.6 and 10.3.6 is now the same.
53.	PRB designations and abbreviations	Relocated the discussion of SRP Sections 5.2.4 and 6.6 due to reassignment of the primary review responsibilities.
54.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Sections 3.9.1, 3.9.2, 3.9.3, and 3.9.6.



**SRP Draft Section PREFACE**  
Attachment B - Cross Reference of Integrated Impacts

Integrated Impact No.	Issue	SRP Subsections Affected
	No Integrated Impacts were incorporated in this SRP Section.	